

REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-13 are pending in the present application. Claims 1-13 are amended by the present amendment to better comply with standard U.S. claim practice.

Claim amendments find support in the application as originally filed, thus, no new matter is added.

In the outstanding Office Action, Figs. 1, 2 and 4(a) and paragraphs [0030], [0046], [0050], [0052] and Tables 1 and 2 of the specification were objected to as including informalities; Claims 5-8 and 10-13 were rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the enabling requirement; Claims 1-13 were rejected under 35 U.S.C. § 112, second paragraph as being incomplete; Claims 1 and 9 were rejected under 35 U.S.C. § 102(b) as anticipated by Ungerboeck in "Channeled Coding with Multilevel/Phase Signals," (IEEE Transactions on Information Theory, Col. IT-28, No.1, pp. 55-67, January 1982, herein "Ungerboeck"); Claims 2-4 were rejected under 35 U.S.C. § 103(a) as unpatentable over Ungerboeck in view of Kaewell, Jr. (U.S. Pat. No. 6,256,339, herein "Kaewell"); Claim 11 was rejected under 35 U.S.C. § 103(a) as unpatentable over Ungerboeck in view of Imai et al in "A New Multilevel Coding Method Using Error-Correcting Codes," (IEEE Transactions on Information Theory, Vol. IT-23, No.3, pp. 371-377, May 1977, herein "Imai").

In response to the informality objections to Figs. 1, 2 and 4(a) and paragraphs [0030], [0046], [0050], [0052] and Tables 1 and 2 of the specification, Figs. 1, 2 and 4(a) and paragraphs [0030], [0046], [0050],[0052] and Tables 1 and 2 of the specification have been amended to correct the informalities noted in the outstanding Office Action.

In response to the rejections under 35 U.S.C. § 112, first paragraph, and the corresponding objection to the incorporation of Divsalar and Simon in the specification, Applicant notes that the mention made as to the reference was not an incorporation of essential material, the only thing provided by the reference was a detailed understanding of the terms Minimum Symbol Distance (MSD) and Minimum Product Distance (MPD) which are by now well accepted in the art. In order to advance prosecution, the reference to the article has been deleted. Withdrawal of the objection to the citation of this article and the improper rejection of Claims 5-8 and 10-13 are respectfully submitted to be in order.

The rejection of Claims 1-13 under the second paragraph of 35 U.S.C. § 112 is traversed. The present amendment significantly revises Claim 1 to insure it recites steps and interrelationships and all of the claims have been modified to remove grammatical and idiomatic translation errors. Accordingly, withdrawal of the rejection of Claims 1-13 under the second paragraph of 35 U.S.C. § 112 is submitted to be in order.

With respect to the rejection of Claims 1 and 9 under 35 U.S.C. § 102(b) as anticipated by Ungerboeck, Applicant respectfully traverses the rejection and submits that independent Claim 1 has been amended to more clearly distinguish over the cited reference. Claim 1 recites, *inter alia*,

A multi-mode block-coded modulation/demodulation method for a transmission system equipped with a multi-mode encoder and a multi-mode decoder, comprising the steps of:
determining a transmission mode based on transmission data contents, an amount of data and a required transmission quality;
making changes to a number of code levels, the multi-mode encoder, a modulation system and a signal point assignment method based on the mode;
encoding the data to obtain a signal;
sending the signal;
receiving the signal;
determining a number of trellis states; and
decoding the received signal using maximum-likelihood decoding.

Ungerboeck describes an extended multi-level/phase signal that is used to acquire an encoded gain using a single mode for a series of codes. However, Ungerboeck does not describe determining a transmission mode based on the transmission data contents, the amount of data and the required transmission quality in accordance with the states of the communication path.

In other words, Ungerboeck does not describe using multiple modes for a series of codes and determining the transmission mode based on the transmission data contents, the amount of data and the required transmission quality in accordance with the states of the communication path.

Thus, Ungerboeck does not describe or suggest “determining a transmission mode based on transmission data contents, an amount of data and a required transmission quality; making changes to a number of code levels, the multi-mode encoder, a modulation system and a signal point assignment method based on the mode; encoding the data to obtain a signal; sending the signal; receiving the signal; determining a number of trellis states; and decoding the received signal using maximum-likelihood decoding,” as is recited in amended Claim 1.

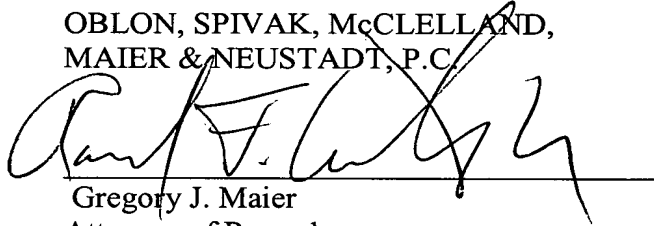
Accordingly, as Ungerboeck does not describe all the elements of independent Claim 1, Applicant respectfully submits that Claim 1 patentably distinguishes over Ungerboeck.

Moreover, with respect to the further dependent claims, in light of the above discussion Applicant respectfully submits that those claims also distinguish over the applied art, particularly as none of these further cited teachings to Kaewell and Imai are believed to overcome the above-noted deficiencies of Ungerboeck.

Consequently, in view of the present amendment and in light of the above discussion, the outstanding grounds for rejection are believed to have been overcome. The application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "Gregory J. Maier", is written over a horizontal line.

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IN THE DRAWINGS

The attached sheets of drawings include changes to Figs. 1, 2 and 4(a). The first sheet, which includes Figs. 1 and 2, replaces the original sheet including Figs. 1 and 2 and the second sheet, which includes Fig 4(a), replaces the original sheet including Figs. 4(a) and 4(b).

Attachment: Replacement Sheets